

## WHAT IS CLAIMED IS:

sub 1.7 1. A DNA encoding a protein having a neoxanthin cleavage activity for improving stress tolerance in a plant.

5 2. A DNA for reducing stress tolerance in a plant, wherein the DNA is selected from the group consisting of:

- (a) a DNA encoding an antisense RNA complementary to a transcript of a gene encoding a protein having a neoxanthin cleavage activity;  
 10 (b) a DNA encoding an RNA comprising a ribozyme activity which cleaves a transcript of a gene encoding a protein having a neoxanthin cleavage activity; and  
 (c) a DNA encoding an RNA which inhibits the expression of a gene encoding a protein having a neoxanthin cleavage activity in a plant cell by the cosuppression effect.

15 3. The DNA of claims 1 or 2, wherein the protein having a neoxanthin cleavage activity is selected from the group consisting of:

- (a) a protein comprising an amino acid sequence of SEQ ID NOS: 2, 6, 10, 12, 14, or 16;  
 20 (b) a protein comprising an amino acid sequence in which one or more amino acids in SEQ ID NOS: 2, 6, 10, 12, 14, or 16 are replaced, deleted, added, and/or inserted; and  
 (c) a protein encoded by a DNA which hybridizes with a DNA comprising a nucleotide sequence of SEQ ID NOS: 1, 5, 9, 11, 13,  
 25 or 15 under the stringent condition.

4. The DNA of any one of claims 1 to 3, wherein the protein having a neoxanthin cleavage activity is derived from *Arabidopsis* plants.

5. A transformant plant cell carrying the DNA of any one  
 30 of claims 1 to 4.

sub 3.3 6. A transgenic plant comprising the transformant plant cell of claim 5.

7. A transgenic plant which is offspring or a clone of the transformant plant of claim 6.

35 8. The transgenic plant of claims 6 or 7, wherein the expression of a gene encoding a protein having a neoxanthin

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cleavage activity is increased or decreased compared with its wild type.

9. The transgenic plant of any one of claims 6 to 8, wherein the amount of abscisic acid is increased or decreased compared with its wild type.

10. The transgenic plant of any one of claims 6 to 9, wherein stress tolerance is increased or decreased compared with its wild type.

11. A propagation material for the transgenic plant of any one of claims 6 to 10.

12. A vector comprising the DNA of any one of claims 1 to 4.

13. A method for producing the transgenic plant of any one of claims 6 to 10, comprising the steps of introducing a DNA of any one of claims 1 to 4 into a plant cell and regenerating a plant from the plant cell.

14. A method for increasing or decreasing stress tolerance in a plant, comprising expressing the DNA of any one of claims 1 to 4 in a plant cell.

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